

CLAIMS

1. A complementary divided mask obtained by dividing a stencil mask into a plurality of complementary divided mask blocks, said
5 complementary divided mask characterized in that:

alignment marks are formed in a respective complementary divided region corresponding to each of said plurality of complementary divided mask blocks.

- 10 2. The complementary divided mask as described in claim 1, characterized in that:

said plurality of complementary divided mask blocks comprise four complementary divided regions.

- 15 3. The complementary divided mask as described in claim 1, characterized in that:

said alignment marks are equally distributed to each of said complementary divided regions.

- 20 4. The complementary divided mask as described in claim 3, characterized in that:

respective marks constituting said alignment marks are arranged as a plurality of rows in which said respective marks are spaced apart therebetween at equidistance, and distance of said respective rows are
25 equally distributed therebetween.

5. The complementary divided mask as described in claim 1, characterized in that:

said alignment marks are unequally distributed to each of said
30 complementary divided regions depending on respective positional precision requirements in each of said complementary divided regions.

6. The complementary divided mask as described in claim 5, characterized in that:

5 respective marks constituting said alignment marks are arranged as a plurality of rows, and a number of said rows having said alignment marks in each of said complementary divided regions differs one another.

7. The complementary divided mask as described in claim 1, characterized in that:

10 said alignment marks are formed in said complementary divided regions with a registration margin corresponding to that required for a subsequent process of patterning with respect to a plurality of existing patterns.

15 8. The complementary divided mask as described in claim 1, characterized in that:

 respective marks constituting said alignment marks are arranged in an array.

20 9. A method for forming alignment marks in a complementary divided mask, characterized by comprising:

 dividing a stencil mask into a plurality of complementary divided mask blocks,

25 distributing said alignment marks in a respective complementary divided regions corresponding to each of said plurality of complementary divided mask blocks, and

 carrying out an alignment operation in a subsequent process using said alignment marks.

30 10. The method for forming alignment marks as described in claim 9, characterized in that:

said plurality of complementary divided mask blocks comprise four complementary divided regions.

11. The method for forming alignment marks as described in claim 9,
5 characterized in that:

said alignment marks are equally distributed to each of said complementary divided mask blocks.

12. The method for forming alignment marks as described in claim 11,
10 characterized in that:

respective marks constituting said alignment marks are arranged as a plurality of rows in which said respective marks are spaced apart therebetween at equidistance, and distance of said respective rows are equally distributed therebetween.

15

13. The method for forming alignment marks as described in claim 9, characterized in that:

said alignment marks are unequally distributed to each of said complementary divided mask blocks depending on respective positional
20 precision requirements in each of said complementary divided mask blocks.

14. The method for forming alignment marks as described in claim 13, characterized in that:

25 respective marks constituting said alignment marks are arranged as a plurality of rows, and a number of said rows having said alignment marks in each of said complementary divided mask blocks differs one another.

30 15. The method for forming alignment marks as described in claim 9, characterized in that:

said alignment marks are formed in said complementary divided regions with a registration margin corresponding to that required for a subsequent process of patterning with respect to a plurality of existing patterns.

5

16. The method for forming alignment marks as described in claim 9, characterized in that:

respective marks constituting said alignment marks are arranged in an array.

10

17. A semiconductor device characterized by:

irradiating a complementary divided mask with an exposure beam, said mask obtained by dividing a stencil mask into a plurality of complementary divided mask blocks, and equally distributing alignment marks in a respective complementary divided regions corresponding to each of said plurality of complementary divided mask blocks, and prepared for carrying out an alignment operation in a subsequent process using said alignment marks;

15

irradiating the surface of said semiconductor device with said exposure beam having passed through said complementary divided masks; and

20

forming thereon a pattern structure corresponding to a desired pattern provided on said stencil masks.

25 18. The semiconductor device as described in claim 17, characterized in that:

said exposure beam is one selected from the group consisting of a charged particle beam, an extreme ultraviolet ray, X-ray, a radiation beam and a visible light.

30

19. A method for manufacturing a semiconductor device, characterized

by comprising:

dividing a stencil mask into a plurality of complementary divided masks,

5 equally distributing said alignment marks in a respective complementary divided regions corresponding to each of said plurality of complementary divided masks,

irradiating said complementary divided masks with a charged particle beam,

10 irradiating the surface of said semiconductor device with said charged particle beam having passed through said complementary divided masks,

forming thereon a pattern structure corresponding to a desired pattern provided on said stencil mask, and

15 carrying out an alignment operation in a subsequent process using said alignment marks.

20. The method for manufacturing a semiconductor device as described in claim 19, characterized in that:

20 said exposure beam is one selected from the group consisting of a charged particle beam, an extreme ultraviolet ray, X-ray, a radiation beam and a visible light.